



PIPELINE IRRIGATION: CHANGING CROPPING PATTERN AND CROP COMBINATION (A CASE STUDY OF ROHTAK DISTRICT IN HARYANA)

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ABSTRACT

This paper attempts to examine the change in cropping pattern and crop combination due to pipeline irrigation in Rohtak District of Haryana. The change in cropping pattern in the study area is examined to understand the share of various crops in the study area during a particular period of time 2005-2015. The present study has been used both primary and secondary source of data. An extensive field survey has been conducted by the researcher in sampled villages. The sampled villages have been selected on the bases of random method of sampling. A pre-tested schedule has been used to get the information. It is found that pipeline irrigation emerged as catalyst in changing of cropping pattern in Rohtak district. It also affects crop diversification in the surveyed area. The present paper also gives some suggestion to overcome these problems.

KEY WORD: cropping pattern, pipeline irrigation, crop combination, crop diversification.

INTRODUCTION:

Haryana is an agriculturally developed state. The major crops of Haryana are wheat and rice which are followed by sugarcane, gram barley, cotton, oil seeds, bajra, jawar, etc. About 80 percent of the total geographical area of the state is under cultivation. Out of which about 84 percent cultivable land have irrigation facilities. Conventionally, canal and tube well is used as a prominent source of irrigation in the state. But it has been noticed that a new way of irrigation is popularly used by the farmers viz. pipeline irrigation. It has been noticed by the researcher that irrigation facilities affects the cropping pattern and crop combination of an area. Cropping pattern indicate the yearly sequence and spatial arrangements of crops and follows in an area. The cropping patterns of a region are closely influenced by the geo-climatic, socio-economic, Historical and political factors (Hussain, M. 1996) The changes in cropping pattern are brought about by socioeconomic influence. "In most of the situations the physical environment reduces the choice of certain crops altogether or by reducing their level. But human factor cannot be avoided in choice of crops grown in a region (Morgan, W.B. and Munton, R.J.C. 1971). Pipeline irrigation is new technique of irrigation through which water is supplied from source of water (tube well) to cropped field. This technique not only has facilitated the irrigation but also increased cropped area under irrigation. It also affects the intensity of crops and irrigation. In last decade from 2005-2015 the pipeline irrigation has been extended very rapidly in Haryana. Recently underground water pipeline has laid down to irrigate 73516 hectares of Haryana between November 2014 to march 2016 (business standard sep19, 2016).

Objectives:

- The present paper finds out the changes in cropping pattern due to pipeline irrigation facilities in Rohtak district.
- It also finds out which crops are emerging as important in area.

Study Area:

The present study focused on Rohtak district of Haryana. It is situated between 28°12'30" to 29°12'54" latitude and 76°9'12" to 77°15'47" east longitude.



The district comes in the zone of semi- arid type of climate. Although there is no natural drainage system but this area is drained by western Yamuna canal sys-

tems (Gazetteer1910), but tube –well also a dominant source of irrigation and the main source that facilitate the pipeline irrigation. Tube-well irrigation is 64% of total land irrigation in this area. However irrigation facilities in the area were not very bad in the region but after canal and tube-well irrigation, pipeline emerged as a paramount source of irrigation in study area. It provides irrigation facilities for those areas where canal water did not reach and ground water is saline

DATA SOURCE AND METHODOLOGY:

There is used both primary and secondary sources of data in the present research work. Primary data has been collected through the field survey. This is conducted by researcher in randomly selected sampled villages. There have been selected 16 villages for the field survey. The sampled villages have been selected on the bases of random method of sampling and have scope for pipeline irrigation. A pre-tested schedule has been used to get the information.

The following villages are selected where field work is conducted: Sanghi (80), khidwali (90), makroli (80), Rithal (70), Kharkhra50, Jassia80, kultana 30, Lakhan Majra 80, Basatpur40, Bahelba 60, Kilo 90, Ghillor40, Madina 50, Chulliana 60, Seman 70, Bhagotipur 60.

Changing cropping pattern increasing use of pipeline irrigation from 2005 to 2015 cropping pattern has been undergone a dramatic change that are clear from the table A, B given below:

Table A: Rohtak District change in cropping pattern 2005-2015

Name of sampled village	Cropping pattern in 2005	Cropping pattern in 2015
Sanghi (80)	Barley, mustard, bajra, til, jute, Arhar, wheat, sugarcane, rice, Cotton, Jawar, barseem,	Wheat, rice, sugarcane, Jawar, barseem
Khidwali (90)	Bajra, Barley, mustard, til, jute, Arhar, wheat, sugarcane, rice, Jawar, barseem, cotton, gram	Rice, Wheat, sugarcane, Jawar, barseem, poly house crops
Makrauli (80)	bajra, til, jute, barley, methi, Arhar, wheat, sugarcane, rice, Cotton, Jawar, barseem, mustard	rice, sugarcane, Jawar, barseem, wheat, fruit, mustard
Bhagotipur (60)	Barley, mustard, bajra, jute, Arhar, wheat, sugarcane, rice, Cotton, Jawar, barseem	rice, wheat, sugarcane, Jawar, barseem, barseem
Rithal (70)	Bajra, barley, methi, Arhar, wheat, sugarcane, rice, Jawar, barseem, mustard	Rice, jawar, barseem, wheat, Sugarcane,
Kharkhra (50)	arhar, wheat, sugarcane, rice, Jawar, barseem, mustard	Wheat, Rice, jawar, barseem, Sugarcane
Seman (70)	barley, mustard, Cotton, Gram, wheat, sugarcane, jawar	Cotton, rice, wheat, mustard, Jawar, bajra
Sunderpur (60)	Arhar, wheat, sugarcane, Jawar, barseem, mustard, methi	Rice, wheat, fruits and vegetable, sugarcane

Table B: Rohtak District change in cropping pattern 2005-2015

Name of sampled village	Cropping pattern in 2005	Cropping pattern in 2015
Kiloi (90)	bajra, barley, methi, Arhar, wheat, sugarcane, Jawar, barseem, mustard	Rice, sugarcane, Jawar, barseem, wheat, mustard
Bahelba (60)	barley, bajra, gram Arhar, wheat, sugarcane, Jawar, barseem, mustard	Wheat, rice, Jawar, barseem, mustard, fruit
Ghilor khera (60)	Bajra, barley, Arhar, wheat, sugarcane, rice, Jawar, barseem, mustard	Wheat, Rice, jawar, barseem, Sugarcane, mustard, vegetable
Madina (50)	barley, bajra, green fodder Arhar, wheat, sugarcane, rice, Jawar, barseem, mustard	Rice, Wheat, sugarcane, Jawar, barseem,
kultana (30)	Jawar, barseem, mustard, Arhar, barely, wheat	Wheat, rice, mustard, jawar, bajra
Basantpur (40)	Barley, wheat, sugarcane, Jawar, barseem, mustard, Arhar	Wheat, Jawar, mustard, Sugarcane, Rice
Chulliana (60)	Arhar, wheat, sugarcane, rice, Barley, mustard, bajra, Jawar, barseem	Rice, sugarcane, Wheat, jawar, barseem
Lakhan Majra (80)	Arhar, wheat, sugarcane, Jawar, barseem, mustard, Methi, gram, barley, cotton	Rice, sugarcane, wheat, Jawar, barseem, oat, fruits

Based on Field survey conducted by Researcher in June 2015

RESULTS:

The observation of field survey clearly indicates that advancement in field irrigation affects the crop-combination in surveyed region. The framers of the surveyed villages have been growing the crop which needs the high amount of water. Before reaching irrigation facilities the farmers growing bajra, Jawar, Gwar, Moong, Arhar etc. Crop in Kharif season where as Wheat, Barley, Gram, Mustard, Barseem were grown in Rabi season in the area.

Undulating agricultural land area which were sowed under Bajra, Jawar, Arhar, Mustard, Barley, Cotton crops before 2005 now these area covered by Rice, wheat, sugarcane, jawar, barseem crops. Differences in cropping pattern of head reach and tail-enders also have decreased. Before 2005 head reach farmer s used to grow sugarcane, rice and wheat while tail Enders mustard, bajra, barley and gram etc.

This form of irrigation had leads to change in crop combination in the area, in kharif season nearly 3/4 the area of cultivated land is covered by rice and remaining land jawar, bajra, cotton, war etc. Where and in Rabi season wheat emerged as monocrop. However mustard, barley, barseem are also grown in Rabi but these are not significant.

The survey finds out that there is changed in sugarcane cropped area, it was cultivated in canal irrigated area and multi crop with mustard but now it is cropped away from source of canal irrigation and multi cropped with wheat. Some crops have been vanished like til, jute, bajra, arhar in many villages. Fodder crops area has been decreased, and pattern also has been changed.

CONCLUSION:

The survey indicates that due to pipeline irrigation facilities the crop pattern and crop combination has been changed. Crop intensity has been increased while crop diversification has been decreased. Fallow land also decreased especially current fallow land. But there is problem of underground water scarcity may be occurred due to in large scale of exploitation of underground water due this facility.

SUGGESTIONS:

Promoting crop diversification and crop rotation. Simultaneously we should promote drip irrigation and sprinkle irrigation. Improving water use efficiency. We should adopt In situ water harvesting "Khet-ka-pani-khet-me".

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